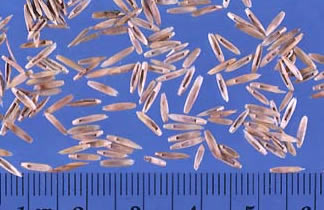
The Effect of Seed Spacing on Ryegrass Growth



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Experiment dates: Tues Nov 4 – Wed Nov 12

Due date: Fri Nov 14

**Introduction**

Perennial ryegrass, *Lolium perenne*, is the main grass used as a food source for grazing cattle in Europe. Ryegrass thrives in cooler conditions and can handle lots of foot traffic.

In order to grow and survive, plants (and algae) perform photosynthesis. Photosynthesis converts light energy into glucose (sugar). The equation for this reaction is shown below:

light

6 H2O + 6 CO2  C6H12O6 + 6 O2

Organisms compete for limited resources such as water, food, and space. Often, the closer organisms are, the more they compete. Therefore to test the effect of seed spacing on seed growth seeds were planted at different distances from each other.

The independent variable was the spacing between the seeds. The dependent variable was the plant height. The constants were the amount and type of soil and water, the size and types of the cups, and the placement of the cups in the room.

**Hypothesis**

If the spacing between seeds decreases (less than one cm apart), then ryegrass growth will decrease because the seeds with compete more for resources such as water.

**Materials**

Ryegrass seeds

Soil

Cups

Labels

Water

Graduated cylinder

Ruler

?

?

**Procedure**

Day 1: Set-up

1. Label three cups with….
2. Fill each cup three-fourths full with soil.
3. ….

Day 2: Watering

1. Using graduated cylinder, measured 10 mL of water
2. …..

Day 3: No class

Day 4: Watering

Day 5: Weekend

Day 6: Weekend

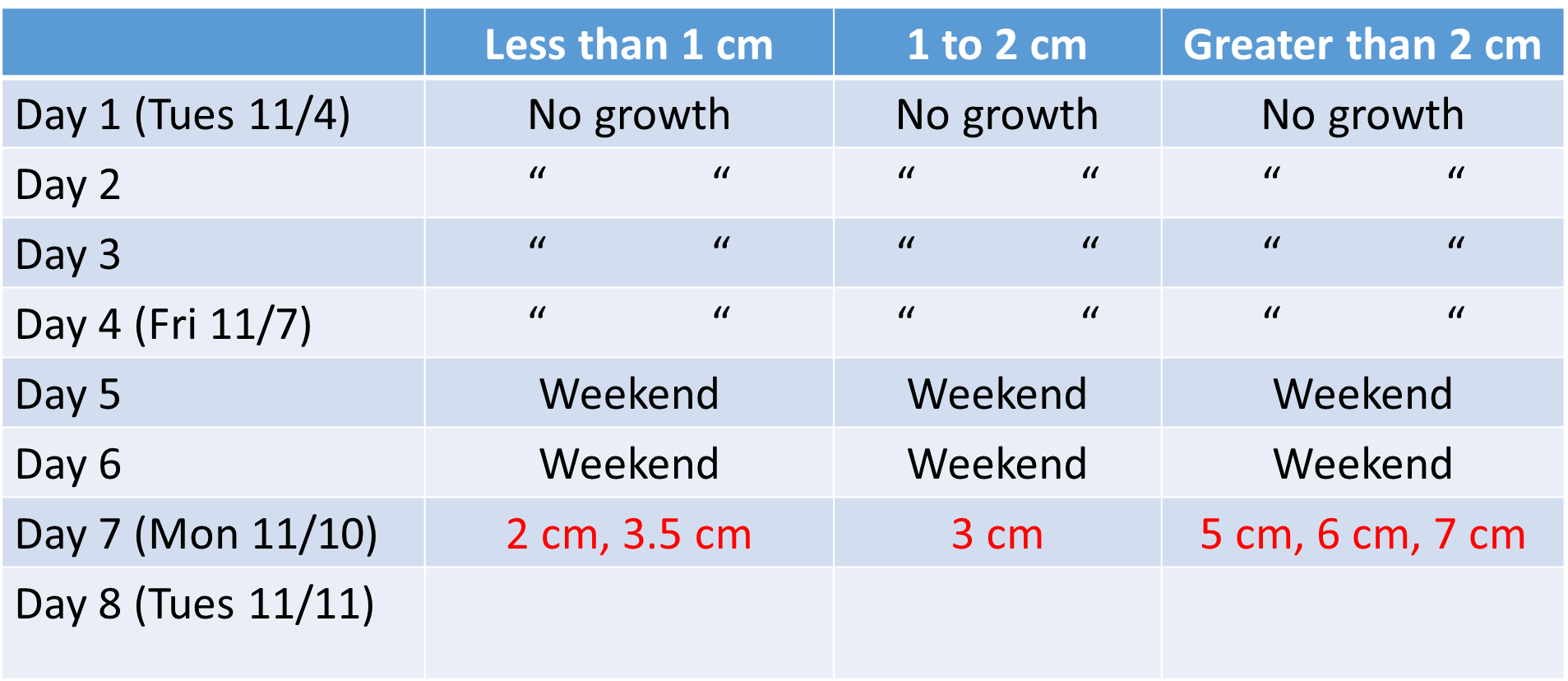
Day 7: Measuring and watering

Day 8: Measuring and watering

**Data**

Figure 1: Plants after eight days

Table 1: Reygrass growth over 8 days

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**Analysis and Discussion**

After eight days the seeds that were spaced greater than two centimeters grew, on average, seven centimeters. The seeds spaced one to two centimeters apart grew, on average, two point four centimeters. The seeds spaces less than one centimeter apart grew, on average, four point two centimeters.

The hypothesis was **“**If the spacing between seeds decreases (less than one cm apart), then ryegrass growth will decrease because the seeds with compete more for resources such as water.” This hypothesis was not supported by the data. Seeds grown the furthest apart, at two cm, grew on average, at least three cm greater than the seeds planted at lesser distances however the seeds grown at the least distance apart, less than one centimeter, grew almost twice as much as the seeds grown one to two centimeters apart.

Possible errors could have been the fact that when the water was poured over the seeds the seeds were moved and thus more or less apart than they were originally placed. In order to prevent this in a future experiment we could slowly pour the water over the seeds so as not to disrupt their placement.

There was also inconsistency in watering. One day one the seeds were watered with 50 mL of water but then realized that was too much water so did not water for again until day three and then watered with 20 mL. In the future we could, before planting, see how much water fits in the container we will plant in and determine how much water we will need.

**Conclusion**

The hypothesis, that the more spaced seeds were, the more they would grow was not supported by the data. Although the seeds grown the furthest apart, at two cm, grew the most, the seeds planted one to two centimeters apart grew less than the seeds planted at less than one centimeter apart. Since the growth of the plants did not consistently increase as seed spacing increased, the data does not support the hypothesis. More trials, which take in account the ways to prevent the errors described in the above discussion, should be performed to obtain more data.

When grass is planted commercially, planters disperse the seeds equally apart so that as many seeds as possible can take root and grow. Seeds are sown with some distance so that they each have access to the necessary resources – water, light, and carbon dioxide.

**Questions** for further investigation

How would even greater spacing, for example, more than five cm, have an effect on ryegrass growth?

**Sources**

Cover image: http://www.agry.purdue.edu/ext/forages/forageid/grasses/grass\_seed.htm

US Department of Agriculture. <http://plants.usda.gov/plantguide/pdf/pg_lopep.pdf>

University of California, Davis. http://www.ipm.ucdavis.edu/TOOLS/TURF/TURFSPECIES/perrye.html

Ms. Killingley’s ryegrass handout.